far as concerned the horses of their own 'Royal Mail Coach.'

"The general character of the landscape varies very little during the whole long stretch of seventy miles between Colombo and Galle, but for all that the eye never tires. The constant charm of the cocoa woods, and the endless variety of the groups of palms prevent any sense of monotony. The glow of the tropical sun is tempered by a cool sea breeze, and by the shade of the palms. It is true, that their feathery foliage does not afford so thick and refreshing a shade as that of our northern forest trees; but very often the slender stems of the palms are covered with a lovely tangle of climbing pepper-wort, and other creepers, which hang in graceful festoons of thick foliage from crown to crown, many of them with blossoms of brilliant hue, such as the flaming *gloriosa superba*, the rose-red Bougainvillea and gay-coloured papillonaceous plants of different kinds. Here and there among the palms stand other trees, such as the noble mango, and the bread-fruit tree, with its thick dark green crown of leaves. The pillar-like stem of the graceful papaya tree (*Carica papaya*), is beautifully inlaid and adorned with a regular diadem of broad, hand-shaped leaves. Different kinds of jasmine, of orange and lemon trees are thickly covered with fragrant white blossoms. And nestling among the trees are the neat white or brown huts with their picturesque surroundings; one would seem to be driving through one long continuous village of palm gardens if one did not occasionally come upon a denser region of forest or upon a real village with its closer row of houses and country bazaar or market place. The road turns frequently towards the sea, and sometimes actually skirts the rocky coast. Here tracts of soft level sand alternate with rocky hillocks picturesquely clothed with the curious pandanus or screw pine. The cylindrical stem of this tree, seldom more than from twenty to forty feet in height, is bent and twisted, and its branches are forked or extended at right angles like a chandelier. Every branch bears at its extremity a thick bunch of large sword-shaped leaves (like the Daacaenæ and the Yucca). Some of the leaves are sea-green, others of a darker shade, all gracefully curved and with a spiral twist at their base, which gives the branch very much the appearance of a screw. At the base of the whole bunch of leaves hang white clusters of blossom with a marvellous perfume, or large red fruit very like the Anana. But the tree is chiefly remarkable for its numerous delicate air-roots, which are given off from the stem and ramify downwards in many directions; when they reach the groundthey take root and serve to support the weak stem. It looks as if the tree were walking on stilts, as it rises above the lower brushwood, pushing its way between the cleft rocks of the shore, or creeping along the ground at their base. The white sand composing the level tracts of the shore is diversified with dark, rocky headlands and animated by brisk little sand crabs so nimble in flight as to have earned the classic name of Ocypode. Numerous hermit crabs too, (Pagurus) wander with a more leisurely pace among their swift-footed cousins, and bear with much dignity the snail shells which protect their soft and sensitive hind-quarters. Here and there sand-pipers, herons, plovers, and other shore birds, are busily employed in catching fish, in formidable competition with the Singhalese fishermen. The latter pursue their calling, some singly, others in companies, in which case they go out in several canoes with enormous nets which they all draw to shore together. (The members of the fisher caste are all Christians, having renounced their Buddhist faith in order to be able to take the life of the fish without deadly sin.) The single fishermen catch their prey by preference in the foaming surf. It is amusing to see the naked brown figures, with only a broad-brimmed straw hat to protect them from sunstroke, spring boldly into the waves and catch the fish in a little hand net. They appear as much in their element in the cool sea water, as do their little children who sport in troops along the shore and swim to perfection at six or eight years old." Among the beauties of this most beautiful journey, Prof. Haeckel further enumerates the river Deltas, of which there are many on this part of the coast, their dark forest of mangrove trees giving the landscape a deeper tone; and also the extensive lagoons which (especially between Colombo and Caltura) connect the rivers of the coast with each other. The Dutch took so much delight in these watery roads as reminiscences of their fatherland, that they formed them into a regular canal system to the neglect of the land roads. Numerous little trading boats sailed along the lagoons from place to place and formed their principal means of communication. But since the English have constructed their present excellent roads, the water traffic has almost ceased.

"The lagoons, with the thick bamboo and palm woods of their shores, with the lovely little islands, and rocky groups mirrored in their bosom, afford to the traveller a succession of enchanting pictures, especially where groups of slender cocoa palms tower over the dark green woodland masses, forming as Humboldt says: 'a forest above the forest.' The long range of hills in the blue distance forms a suitable background, higher mountain summits beyond rising here and there, and the stately dome of Adam's Peak towering over all."

NOTES

JUST three weeks after the sad death of Prof. Balfour, science has sustained another great loss in the death of Mr. W. Stanley Jevons. He was drowned in the sea between St. Leonard's and Bexhill, on Sunday morning, while bathing. He and his wife and family had been staying at Cliff-house, Galley-hill, for the last five weeks. Mr. Jevons was only in his forty-seventh year. Further details we must reserve for next week.

THE death is announced of Prof. Leith Adams, M.A., of the Queen's College, Cork. Entering the Army in 1848 as assistant surgeon, he became Surgeon-Major in 1861. His report on the Maltese cholera epidemic of 1865, and his devotion to the sick, received warm praise. He ultimately retired from the army in 1873 with the rank of Deputy Surgeon-General, and was appointed Professor of Zoology in the College of Science in Dublin, holding the chair till 1878, when he became Professor of Natural History in the Queen's College Cork. He was made a Fellow of the Geological Society in 1870, of the Royal in 1872, an LL.D. of Aberdeen in 1881, and a D.C.S. of the Queen's University a few weeks before his death. His chief works are the "Wanderings of a Naturalist in India," the "Western Himalayas and Cashmere" (1867), "Notes of a Naturalist in the Nile Valley and Malta" (1870), "Field and Forest Rambles, with Notes and Observations on the Natural History of Eastern Canada" (1873), and his "Monograph on the British Fossil Elephants" (1877).

A SCHEME for obtaining in a more effectual manner than hitherto a complete Annual Record of published scientific work is to be brought before the British Association this year by Prof. Sollas, of University College, Bristol. It requires (1) that each nation furnish a record of its own work, and of that only; (2) that each nation receive the records of every other nation in exchange for its own. Each nation would then merely have to classify and translate the records. For the working out of the scheme (*a*) National Committees, and (*b*) an International Congress would be required. The Committees, each consisting of a number of sections, would have, as functions, to produce the national records, to receive and transmit exchanges, to arrange for translations, and to superintend the combination of the sepa rate records into a whole. The International Congress should consist of representatives of each of the Committees; and it would aim at securing so much uniformity as would be necessary for the successful working out of the scheme without interfering with the liberty of the Committees; it would also afford an opportunity for the interchange of ideas. Such a Congress might indeed be made a part of an International Association for the Advancement of Science. The scheme presents certain difficulties, especially that of expense, but these will doubtless be fully discussed by the Association when the subject is brought forward.

PROF. PRESTWICH has prepared "An Index Guide to the Geological Collections in the University Museum, Oxford" (Oxford: Clarendon Press), which is of a more general nature than the late Prof. Phillips's "Notices," and includes the large local collections, with regard to which he not only shows the various genera existing at each period, but gives the names of places where the fossils are to be met with. In the series of organic remains the student is enabled to follow the succession of life forms from the earliest palæozoic periods to the present; and in general, the relative place of the specimens in systematic classification and geological age is indicated.

A TELEGRAM from the Swedish Circumpolar Expedition party dated August 6, was received in Stockholm on the 11th inst. *viâ* Tromsö, where it had been brought by a Norwegian fishing smack; the Expedition has been unable to land on account of ice in Mossel Bay, and has in consequence returned to Cape Thordsten on the Norse islands, where the party landed, erected magazines and an observatory, and where observations are now being made. The message states "all well."

IT is noteworthy that Bossekop, one of the Polar stations selected this year for establishing an observatory, has before been occupied by a French scientific mission, sent in 1838 in *La Recherche*. The mission was composed of MM. Lottin, Bravais, and Charles Martin. They sailed in 1838 for Bossekop, where they stayed from September 1 of that year till April 30, 1839. This Polar exploration was followed by observations taken on Mont Blanc. The French North Polar Expedition was sent by the Government in connection with another directed to the Southern Polar seas, and conducted by Dumont d'Urville, who left Toulon on September 7, 1837, with the *Astrolabe* and the *Zeta*. This time English and American expeditions are sent to these remote and dangerous regions.

INTELLIGENCE received at Buenos Ayres, on July 15, announces the wreck at Cape Horn, of the vessel with Lieut. Bove and the members of the Italian Antarctic expedition on board. Lieut. Bove and his companions were saved by the English cutter *Allen Goden*.

ON Monday the annual Congress of the German Anthropological Society began at Frankfort. After an opening address by the President, Prof. Lucae, on the development of anthropology during the last ten years, Dr. Schliemann delivered a lecture on his latest excavations at Troy. He was followed by Prof. Virchow, on Mr. Darwin's relations to anthropology. About 500 members were present.

DR. MACKINTOSH, Superintendent of Murthly Asylum, Perthshire, has been presented by the patron, the Marquess of Ailsa, to the Natural History Chair in the University of St. Andrew's, vacant by the transfer of Prof. Nicholson to Aberdeen.

THE Trustees of the Gilchrist Educational Trust have arranged for courses of "Science Lectures for the People" during the ensuing winter in five towns of Central Lancashire, in five Scotch towns, and in Leicester, Lincoln, Chesterfield, Doncaster, York, Reading, and Banbury. The lecturers who will take part in them are Dr. Carpenter, F.R.S. (the Secretary to the Trust), Prof. Balfour Stewart, F.R.S., Prof. W. C. Williamson, F.R.S., Dr. Martin Duncan, F.R.S., Rev. W. H. Dallinger, F.R.S., and others.

WE learn from the *Photographic Times* (U.S.) that the third Annual Convention and Exhibition of the Photographers' Association of America was to meet at Indianapolis on the 8th inst. Mr. Muybridge, who has returned to America, purposes giving a series of lectures this autumn on instantaneous photography and what it has revealed.

CONCERNING the August meteors, Mr. Donald Cameron writes us from Aberfeldy, under date August 7, that there was a bright display the previous night witnessed by him from the right bank of the Tay. The meteors were many and brilliant, some of them comparing favourably with stars of the first magnitude; but they were very transient and left no traces of light. One of the longest in duration was one shot down at right angles to the horizon from a point equidistant from Saturn and the fifth bright star in Auriga. The region north of the Milky Way (which was bright and well defined) was the principal theatre of the display. At midnight the meteors became very rare, and Mr. Cameron waited till 1 a.m., seeing scarcely any. He remarks on the striking apparent proximity of the stars to the earth in those clear mountainous regions, the brightness of the moon, though, in her last quarter, on the night in question, and the silence of the owls which had been very noisy for some weeks before.

MR. STANFORD has published a Map of the Seat of War in Lower Egypt, on the scale of two miles to the inch; it is exceedingly clear, and likely to be of service to those desirous of watching the progress of operations

THE several designs presented to the Commission for the large dome of the Paris Observatory are being exhibited in the Museum of Astronomy established by Admiral Mouchez. The Commissioners have given the first prize to the design sent in by MM. Cail, of Paris.

M. DUVAUX, the new French Minister of Public Instruction, was formerly director of Nancy College. Since M. Jules Simon resigned, it is the first time that this high office has been given to a professor. This circumstance is considered as being important at a time when public bodies are showing such an interest in the cause of general and special education.

THE brickwork of the subterranean chambers of the Observatory of Paris, constructed for magnetic observations, is now quite finished. Admiral Mouchez intends to use a part of it, in order to study the changes of a mercurial reflecting surface, produced by the attraction of celestial bodies. The changes will be observed with a collimator watching the motion of the reflected image. The determinations will take place in an underground corridor, of which the length is upwards of forty yards and may be considered as being of invariable temperature.

A FIRE, caused by an electrical wire at the Paris Opera House, has created quite a sensation in the scientific world, although it has been successfully kept from the knowledge of the public. Mr. Geoffroy, a wire manufacturer in Paris, has taken a patent for covering electric wires with asbestos. Experiments, which will be repeated officially have proved that the copper can be burned without any spark being conducted outside. Another fatal accident from a similar cause occurred last week in Paris. Two young people wishing to introduce themselves into the Tuileries Gardens without paying the entrance-fee to a fair, came in contact with the wire conducting the electricity of a Brush machine to the lamps, and were killed instantly.

Prof. Maggi has recently made a protistological analysis of the water of Lake Maggiore, taken at a depth of about 200 feet between Angera and Arona. There is a proposal, it is known, to supply Milan with potable water from this source. No injurious *bacteria* or *flagellata* were detected. The small deposit, probably from the bottom of the lake, is pronounced innocuous; it consists partly of harmless inorganic matter in reduction, and incapable of further evolution. The few diatom scales in it are harmless, being pure silica. The very small number of live organisms, as an *Amœba radiosa*, Auerb., some Diatoms, and *Chlorococcum vulgare*, Grév., indicate that the water is pure; for otherwise their life would be impossible. The Diatoms and Chlorococcum, feeding on inorganic matter, cannot serve as criteria of the presence of putrescible substances. These organisms were always found alive, even several months after extraction, so that their presence in small quantity could not be very hurtful; still it would be well to purify the water containing them. In fine, Prof. Maggi pronounces the water in question serviceable for industrial and domestic use. (For further details of this research we must refer to the *Rendiconti* of the Reale Istituto Lombardo, vol. xv. fasc. ix., x.).

In an article on Foreign Chinese Literature the *North China Herald*, in a recent issue, refers to the translation of modern scientific works into Chinese. In May, 1877, a Committee of the general body of missionaries in China was appointed to superintend the publication of a series of scientific and educational works in the Chinese language for use among the Chinese. This project has been carried out ever since, and a large number of text-books are now undergoing translation at the hands of Sinologues. The majority of the workers are missionaries, but their ranks have been largely recruited from other sources. The subjects undertaken are of a most comprehensive nature. They include treatises on logic, mental and moral philosophy, political economy, philology, jurisprudence, the philology and structure of plants, anatomy, mathematical physics, church history, meteorology, astronomy, chemistry, trigonometry, algebra, natural philosophy, zoology, ethnology, mineralogy, physical and political geography, history, besides other works. The undertaking of this large and important series of works reflects the highest credit on the industry and intelligence of the missionary body. But the work of putting the Chinese in possession of the results of Western knowledge has not been confined to the missionaries. The Inspector-General of Chinese Customs, Sir Robert Hart, who is known as an indefatigable educator of the Chinese, is now superintending the translation of a series of scientific text-books into the Chinese vernacular. The Imperial College at Peking is assisting in the work.

A meeting of Japanese *literati*, versed in European, Chinese, and Japanese languages, was recently held in Tokio. Among those present were the officers of the education and other departments, who regret the confusion and intricacies of the Japanese spoken and written languages. The object of the meeting was to consider the best steps to be taken for purifying the Japanese language from all foreign elements. After a lengthy discussion it was decided to publish grammars and other books in *Kana*, or the syllabary system, without the employment of Chinese characters. A periodical is also to be devoted to the furtherance of this scheme. The project seems a visionary one. The Chinese element in the Japanese language is a very ancient and powerful one. All Japanese philosophy, much of its religion, its arts and sciences, have come from China, and have brought their terminology with them. Even at the present day, when the Japanese want a name for western inventions, for steam, railways, &c., they go to China for them. Not many years since, a Japanese gentleman, who has since risen to a high position in the service of his country, gravely proposed the abolition of all kinds of Japanese and Chinese writing, and the application of Latin letters to the Japanese language. This reform is more radical than that now proposed, but it would seem almost as easy of accomplishment.

We have received from New South Wales an interesting Report of the Trustees of the Australian Museum for 1881. This Museum is open on Sundays, when the attendance is very large indeed. The total number of visitors was 115,655, being an increase of 3192 on the number for 1880. The number who attended on Sundays was 41,660, being an increase of 8963 on the number for 1880, while the attendance on week-days decreased by 5771. The average daily attendance on week-days was 281, and on Sundays 801. The collections made during the dredging excursion to Port Stephens in November, 1880, were in some orders and families very extensive, but they have not yet been entirely worked out. The crustacea have been determined by Mr. Haswell, and the mollusca by Mr. Brazier. The vertebrates are all well known species, excepting some small deep-sea fishes. Most of the specimens were obtained within Port Stephens itself; and, with some differences in detail, they represent a fauna very similar to that of Port Jackson. The total number of species (invertebrata) procured may be roughly estimated at 700. Of these the mollusca, chiefly of minute kinds, comprise 450 species (1500 specimens), forty-seven of which are new to science. There were obtained also many fine specimens of sponges, of species hitherto unrepresented in the Museum. Among the corals there are several rare species, and some are new. Many other important additions have been made to the Museum. Among the collections purchased have been many very valuable ethnological specimens from the South Sea Islands, of a kind which it is daily becoming more difficult to obtain. A collection of fishes from New Guinea was also purchased. The Trustees are about to publish a Catalogue of the Crustacea of the Australian Seas. This work has been prepared by Mr. W. A. Haswell, M.A., B.Sc., and will be of great scientific value, containing, as it does, descriptions of all known Australian species, many of which are new to science. A Catalogue of the collection of fossils has also been prepared. Both of these will shortly leave the printer's hands. Mr. Brazier has been engaged in cataloguing the collections of shells. The most important work undertaken by the Trustees during the year has been the renewal of the exploration of the caves of the Colony; for which object a special sum of money was voted by Parliament. The bones obtained there are all of recent origin, belonging to still existing species of the kangaroo, wallaby, wombat, opossum, &c. The Siluro-Devonian fossils, however, obtained from the limestone rocks are of considerable interest, and will form a valuable addition to the Museum collection. In one of the caves at Wellington, known as the Breccia Cave, above 1000 specimens were obtained, many of them of great interest; among others an almost perfect ramus of a Thylacoleo with the articulating condyle; and the toe bones of a large species of Echidna. In another cave the tooth of a Diprotodon and some bones of small marsupials were found. In some other shafts the bones were larger and more perfect than those in the Breccia Cave. Among the most important discoveries were portions of the pelvis of an immense kangaroo, caudal and cervical vertebræ; jaws of large marsupials, especially five rami of Thylacoleo nearly perfect, and many good teeth. A list of the most important specimens discovered is contained in the Appendix.

With regard to the doctoring of wines by the process known as *plâtrage* (*i.e.* adding plaster of Paris, or calcium sulphate, which decomposes the potassium tartrates, producing sulphate of potassium, and preventing much of the astringent and colouring matter from passing into solution), the Canton of Berne in September, 1879, issued an ordinance, fixing as an upper limit for potassium sulphate in wines so doctored, 2 grammes per litre. Various complaints then arose from merchants, who thought the regulation too stringent; and the Direction of Internal Affairs nominated a Commission, consisting of Herren Lichtheim, Luchsinger, and Nencki to study the subject afresh. In their report (*Journal fur Prakt. Chem.*) they come to the conclusions (1) that the perniciousness of plastered wines even when they contain more than 2 gr. sulphate of potassium per litre, is far from being demonstrated indisputably. On the other hand it remains proved that wines strongly plastered have sometimes caused slight accidents, and it results from our theoretic study that the prolonged use of such a drink cannot be without prejudice to health; (2) that we therefore do not think it well to leave the trade in plastered wines without any control. While recognising the difficulty of fixing an absolute limit for plastering, they approve as sufficient that of the ordinance in question; on the one hand, it guarantees the public against illness from use of wines too much plastered, and on the other it is not a heavier fetter for the producer than similar prescriptions in France, where the interest in tolerance of plastered wines is vastly greater. Each buyer who has ordered a natural wine should have the right to refuse any wine containing more than 0·6 gr. neutral sulphate of potassium per litre. The reporters are unable to answer a question as to the action of plastered white wines on the system as compared with red.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. F. Logie Pirie; two Silver Pheasants (*Euplocamus nycthemerus*) from China, presented by Mrs. Hames; a Peregrine Falcon (*Falco peregrinus*), European, presented by Col. A. Brooksbank; a Peregrine Falcon (*Falco peregrinus*) captured at sea off Ceylon, presented by Mr. Tom Broune; six Common Kingfishers (*Alcedo ispida*), British, presented by Mr. T. A. A. Burnaby; two Slow-worms (*Anguis fragilis*), two Common Vipers (*Vipera berus*), British, presented by Mr. Charles Taylor; a Moustache Monkey (*Cercopithecus cephus*) from West Africa, two Common Ravens (*Corvus corax*), British, two Common Boas (*Boa constrictor*) from South America, deposited; two Shags or Green Cormorants (*Phalacrocorax cristatus*), European, purchased.

CLIMATE IN TOWN AND COUNTRY[1]

THE speaker began by describing the construction and uses of the instruments with which he had studied the conditions of climate, for many years past, in various parts of Europe. For the determination of sun temperature, he used a thermometer technically known as the blackened bulb *in vacuo* laid in full sunshine upon a sheet of white paper. The shade or air temperature was measured by an ordinary thermometer with a clear glass bulb and a scale engraved upon the stem. This thermometer was placed upon the same sheet of paper, and was shaded by a small white paper arch which admitted of a free circulation of air around the bulb.

He then explained the terms "sun temperature," "shade temperature," and "solar intensity." By shade temperature is meant the temperature of free air in full sunshine. Strictly it ought to be ascertained without any shade at all; for as soon as a shade is produced, conditions are introduced which often entirely baffle the object of the observer. The shade of a parasol has a different temperature from the shade of a tree, and this, again, differs widely from that of a house. The temperature of the shade of a sheet of tinfoil is quite different from that of a sheet of writing paper. Indeed it may be truly said that every shade has its own peculiar temperature. The following table shows the effect of the area of shade, and of the quality of the shading material:—

Beneath larch tree	19°·5 C.
,, white parasol	25·0
,, small white paper arch	35·0
,, small arch of bright tinfoil ...	45·2

Thus shade temperatures, measured during $1\frac{3}{4}$ hours of uninterrupted sunshine in the middle of the day, and within a few yards of the same spot, differed by no less than 25°·7 C. These observations were, however, made at Pontresina, 5,915 feet above the sea-level, and so wide a range does not occur at lower altitudes.

The most effective shading material is, obviously, that which most perfectly reflects solar heat; and of all materials with which he had experimented white paper was found to be the best, white linen and zinc-white being nearly equal to it. The most trustworthy shade thermometer, therefore, is one having its bulb covered with a thin layer of one of these materials; or the naked layer may be shaded by a small arch of white paper.

The term "sun temperature," as commonly employed, has a very vague meaning. If a body could be placed in sunlight under such circumstances as to absorb heat rays and emit none, its temperature would soon rise to that of the sun itself. But, as all good absorbers of heat are also good radiators, the elevation of temperature caused by the exposure of even good absorbers to sunlight is comparatively small. Thus an isolated thermometer, with blackened glass bulb, placed in sunshine, will rarely rise more than 10° C. above the temperature which it marks when screened from direct sunlight. Under these circumstances, however, the thermometer loses heat not merely by radiation, but also by actual contact with the surrounding cold air. If the latter source of loss be obviated, a much higher sun temperature is obtained. Thus, the blackened bulb enclosed in a vacuous clear glass globe will sometimes, when placed in sunlight, rise as much as 60° C. above the shade temperature, and a still higher degree of heat may be obtained by exposing to the sun's rays the naked blackened bulb of a thermometer enclosed in a wooden box padded with black cloth, and closed by a lid of clear plate glass. Thus he obtained with such a box, on the 22nd of December, in Switzerland, when the air was considerably below the freezing point, a temperature of 105° C., and a still higher temperature could doubtless be obtained by surrounding the thermometer with a vacuous globe before enclosing it in the padded box. These widely different temperatures, produced under different conditions by the solar rays, show that such observations can be comparative only when the thermometer employed to measure them is always surrounded by the same conditions. All the sun temperatures here mentioned were measured when the "blackened bulb *in vacuo*" was laid horizontally upon a sheet of white paper with its stem at right angles to the direction of the sun's rays.

"Solar intensity" is relative only, and means the number of degrees through which the sun raises the temperature of a blackened bulb *in vacuo* over the shade temperature. Hence the two temperatures must be observed simultaneously, which is a laborious operation when continued half-hourly throughout the day. By the use of a peculiar self-registering differential thermometer, however, which he had recently described to the Royal Society (*Proceedings* of the Royal Society, 1882, p. 331), the maximum solar intensity during the day is recorded by one reading only. The solar intensities commented upon in this discourse were ascertained by subtracting, in each case, the shade temperature from the sun temperature taken synchronously. The precautions necessary are described in the paper to the Royal Society just quoted.

The chief things affecting climate are the following:—(1) The sun. (2) Land and water—ocean and atmospheric currents. (3) Aspect—slope of ground, exposure or shelter. (4) Nature of surface. (5) Reflection from land and water. (6) Rain and clouds—suspended matter in the air. (7) Latitude—incidence of solar rays, thickness of air. (8) Presence or absence of aqueous vapour. Of these, the first three are obvious and require no comment. The remainder are less well known, but their importance demands our special attention.

Climate, or rather genial climate, is ultimately resolvable into two prime factors—sun-warmth and air-warmth. The amount of sun-warmth (assuming the sun's heat to be constant) depends upon two things only—length of day, and quantity of suspended matter and aqueous vapour in the air. The warmth of the air depends upon contact with matter heated by the sun's rays and upon the stoppage of radiation from the earth by aqueous vapour.

---

[1] Lecture delivered at the Royal Institution of Great Britain, February 10, 1882, by E. Frankland, Esq., D.C.L., F.R.S., M.R.I., Professor of Chemistry in the Normal School of Science, South Kensington Museum.